YLEM JOURNAL

ARTISTS USING SCIENCE AND TECHNOLOGY

LATE NEWS: CALL FOR ENTRIES: NEW DIMENSIONS OF ART '86

The 18th Annual Seattle Arts Festival at Seattle Center, August 29 to September 1.

About 200,000 visitors are expected for the festival.

Art is sought that represents creative work with light, motion, participant interaction, lasers, computer graphics, etc.

Work will be selected by a jury of artists and art professionals.

Slides must be submitted before July 15 to be considered for display at the festival.

Send to:

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New Dimensions of Arts '86
P.O. Box 40283
Bellevue, WA 98004
(206) 462-0500

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RANDOM ACCESS

Ylem News and Events

YLEM SECOND NATIONAL CONFERENCE

In conjunction with the American Craft Council Conference:

"Art, Culture, Future"

The Ylem conference will be held Wednesday, June 4, 3:00 - 5:45 pm at Building E, Room 257, Laney College, 900 Fallon, Oakland. (Laney College is two blocks from the Lake Merritt Bart Station.)

SPEAKERS AND TOPICS

NANCY GORGLIONI: "LOVE OF LIGHT"
(Performance art and holograms.)

VERNON REED: "CYBERNETIC JEWELS"
(Pendants animated with LCDs.)

BEVERLY REISER: "CALLIGRAPHY AND LIGHT"
(Neon light sculptures.)

TRUDY MYRRH REAGAN: "THE EARTH'S CRUST AS ART"
(Geography expressed in shibori.)

ELEANOR KENT: "HONEY ON THE XEROX"
(A playful approach to high technology.)

STEWART McSHERRY: "IMAGE SYNTHESIS"
(Computer-mapping video motion onto geometric solids.)

JOAN MICHAELS-PAQUE: "TOPICAL FIBERWORKS"
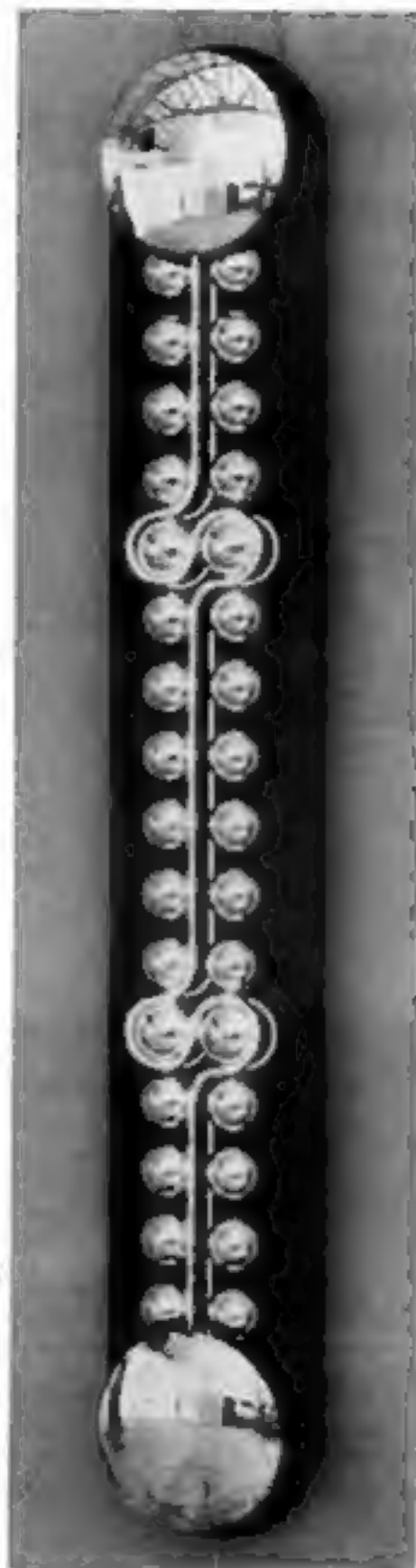(Fiber bas-relief based on mathematics.)

NEON LIGHT SCULPTURE

By Beverly Reiser and Kennen Herrick

June 6-July 25, M-F 9 am to 5 pm

American Institute of Architects
315 14th Street, Oakland, CA
Opening reception:

Friday, June 6, 1986
5:30 - 7:30 pm

Serpentine #1, 1986, 4-1/2" high.

By Ken Herrick.

MODERN VISUAL COMMUNICA-TIONS OPENS DOORS MAY 20

Modern Visual Communications (MVC) swings the doors open May 20 to the first comprehensive electronic art complex in Los Angeles.

Featuring Technokinetic works from top electrofuturist artists around the world, MVC provides a synthesis for avant-garde artists working with the interface of art and technology. The multi-faceted facility is designed to effectively integrate the new genre of Technokinetic art into society by representing these artists and showing their work.

Housed within the landmark art deco complex at 7229 Melrose Avenue are multiple closed-circuit gallery spaces specifically designed to show multi and single monitor video works, computer-generated art, holography and other forms of electronic art. Many of the represented artists' works have been exhibited and are in the collections of some of the world's most important museums, including the Museum of Modern Art and the Whitney in New York, the Centre Pompidou in Paris, L.A.'s Museum of Contemporary Art and the Long Beach Museum of Art.

Among the artists to be featured in MVC's premiere show are Woody and Steina Vasulka, pioneers in the development of electronic art. Exploring the possibilities of the video medium for more than 15 years, the two have created a substantial body of important work. "THE WEST," a continuous two channel video, four channel audio environment will be shown as a 10-monitor installation and available as a signed limited edition laser disc.

BY

Beverly Reiser

"ART AND THE COMPUTER"

March 27-April 20
Berkeley Art Center, 1275 Walnut Street, Berkeley, Ca. Curated by Harry Critchfield.
Works by Ylem members: Alan Rath, Daniel Cooper, Luz Bueno.

The recent show "Art and the Computer" at the Berkeley Art Center revealed three distinctly different ways of using the computer in the process of creating an art object.

Each way reflects a fundamental philosophic and/or aesthetic orientation as represented by Luz Bueno, Daniel Cooper, and Alan Rath.

LUZ BUENO

The outstanding quality of Luz Bueno's work is retention of the appealing innocence of folk art while using advanced techno-media. This included a Via Video System One computer with Ultra paint software.

After inputting a drawing (sometimes a drawing from her childhood in Peru), Luz proceeds to alter the drawing electronically with stylus, pad or software until she is satisfied with the results. Depending on her aesthetic inclination, at that point she decides whether to make a slide by photographing the image on the monitor or to make a slide using her Matrix camera. When using her Matrix, she stores the pictorial information on disk and feeds the disk into the Matrix camera. The Matrix then translates the information from disk into a slide, allowing the artist to make some RGB color adjustments along the way.

The final output, which ends up in a gallery, is a color photo print made from the slide. So, the computer enters the art-making process in the middle and exits before the final object is produced. Through all this technological process, somehow the human warmth, charm and directness of her South American childhood remains to permeate the final image.

In addition to making her own art, Luz is director of the Berkeley School for Computer Graphics which she established four years ago. Since she is teaching Computer Graphics to anyone interested, many of her students have had no previous computer experience. The system is "user friendly". That having been said, the Berkeley Graphics is a professional school involved in the training and occupational retraining of designers, commercial graphics artists, and fine artists in the field of computer graphics and computer image processing.

In addition to teaching and computer graphics production, Luz Bueno gives presentations which include slides of computer art and an overview of the field of computer graphics.

Luz Bueno and her staff have developed professional interactive training courses in computer graphics covering both established techniques available with the software, and advanced methods developed through research at the school.

For info. call: (415) 524-2163 or (415) 524-1668

Buddha's Basic, oil/canvas.
Copyright 1985 by Daniel Cooper.

Figure A.

Figure B.

DAN COOPER

Dan Cooper's aim in his work is to achieve an aesthetic harmony between high technology and nature's organic forms. Computer technology tends toward the hard edge, geometric or mathematical. Organic form is generally the opposite. Dan believes that there is a prevailing assumption in our culture that the technology of man (i.e., computer technology) is inherently in opposition to the structure of nature, and that this assumption inevitably brings negative results. Using the computer in his work represents Dan's attempt to bridge this presumed gap and create harmony between the two worlds. He used the tool that is fundamental for high technology, the computer, to express human values.

None of Dan Cooper's finished works is meant to be viewed on the computer monitor. The original form that he started with, however, was generated on his Apple II in Basic. Dan starts with a feeling which he expresses in the logical language of a program. He sees this program as a series of instructions akin to a DNA code for a growing form in nature. The program varies according to programmed variables. It is printed out on a dot matrix printer, then enlarged to a transparent film positive which is turned into a photo silk screen and finally printed as the basic design. Over this basic design are later printed many layers of paint (not generated from the computer) until Dan is satisfied with the final image. The later layers of silk screening are hand done.

To sum up, Dan Cooper starts with a feeling, generates a computerized image and then completes the process by hand. The computer enters fairly early in the process and exits long before the finish. Figure A is one of his forms straight from the computer and Figure B is a close-up of an area in the upper right hand quadrant of the finished work based on that structure. The finished print is titled Buddha's Basics.
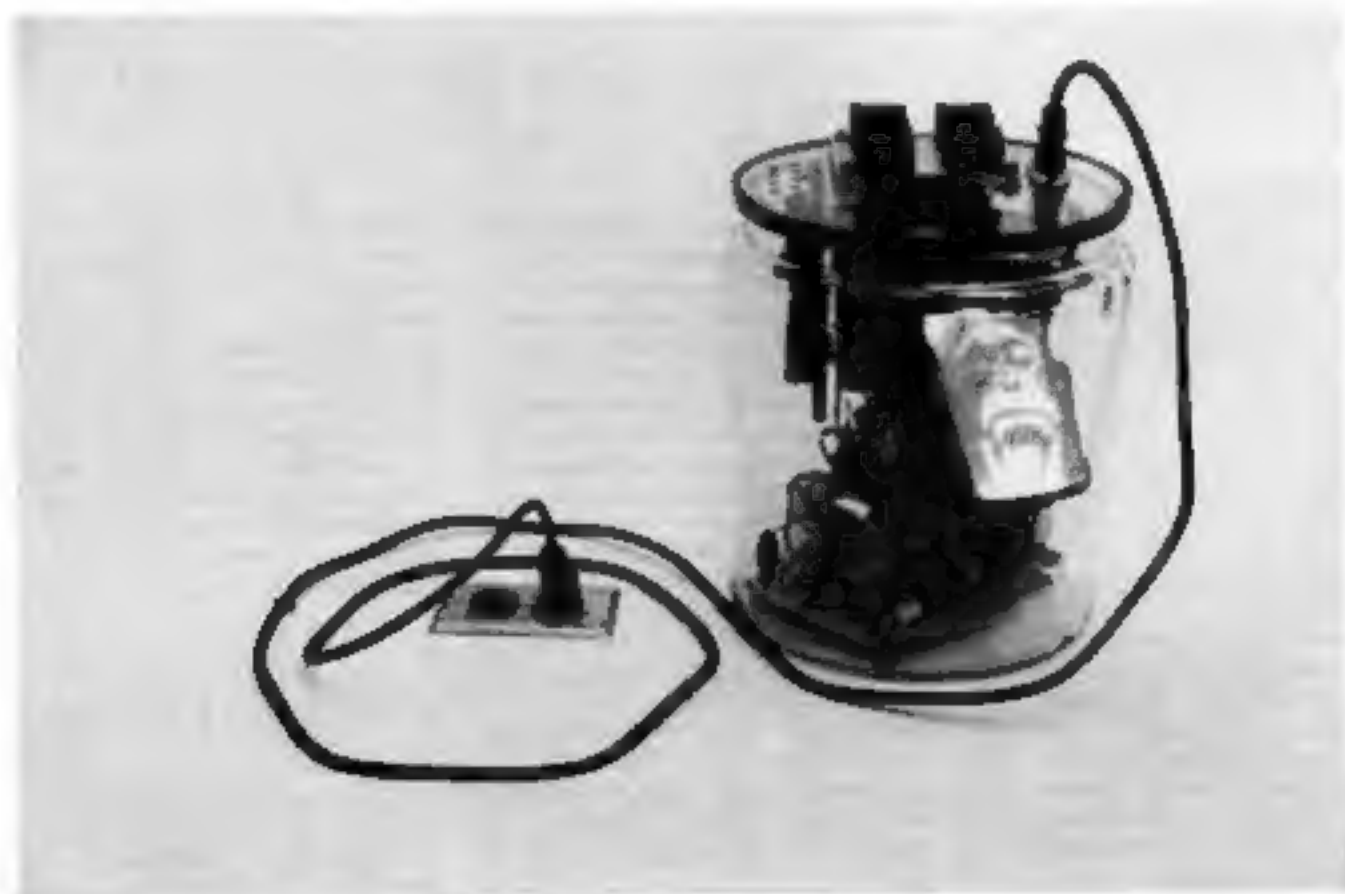
ALAN RATH

Alan Rath sees his work as "process sculpture". He is not interested in producing an end product detached from the electronic process that has generated it. Consequently, his pieces all consist of a CRT connected electronically to a frame buffer which holds the information describing the image seen on the CRT. All the electronic inner workings are visible to the viewer and, indeed, are an integral part of the visible art object.

Alan's work comments on the relationship between man and his tools, and it speaks to the emotional realm. One of his pieces is a working CRT tuned to network TV and attached to the end of a shovel handle where one expects the metal spade end to be. It is titled Useless Tool. I can only presume that this is a comment on the vacuous content of the bulk of network programming.

One of the pieces in the Berkeley show, which grew on me as I dallied in the gallery, is called Heart Beat. A large CRT is dangling from a tripod- like structure and, again, is connected electronically by visible cables, (or arteries?) to a frame buffer. On the CRT is simple grid work, which is not particularly interesting, except that the upper left corner seems to twitch or throb with a motion very much like a human heart beating and pumping.

NOTICE

Dorothy Atkins and Harry Critchfield, both on the faculty of California College of Arts and Crafts, generated a computer graphics competition, the results of which were displayed during April at Infomax in downtown Oakland. The jurors for the competition were Aaron Marcus and Daniel Cooper. The good news about this show is that it will become an annual competition and next year will be placed in the gallery on campus at CCAC.

Animal Experimentation, By Alan Rath.

Self Portrait, by Luz Bueno

I enjoy using all these imaging "gadgets". They are easy to learn. The endless array of colors, textures, and graphic effects they provide seem out of this world. You sit at the computer and immediately go into "flow mode", expressing thoughts and feelings in color and line. The medium is free and fluid. You think, "This is the way art was meant to be!" Hours later you come up for air, hardly aware of the passage of time and begrudging your need for sleep.

COMPUTER GRAPHICS STUDIO— AFFORDABLE REALITY

by
LUZ BUENO
Director, Berkeley School
for Computer Graphics

ARTIST IN WONDERLAND

Five years ago my art tools were things of the earth: clay, plaster, charcoal and pigments. Then came an opportunity to do freelance work for Via Video, an early pioneer in computer graphics and video animation. In this new medium I found new challenges and new graphic potential. From this work evolved the Berkeley School of Computer Graphics, which over the past four years has trained a wide spectrum of art professionals on Via Video System One, a high-end computer graphics studio work-station. Computer graphics is addicting; now it would be hard to work exclusively with conventional studio materials.

THE ARTIST'S TOOLS

What are the features and compo-nents of a professional computer artist's workstation? Via Video was one of the first to market a micro-based system. Its box is filled with boards interfaced to a high resolution frame buffer; it provides RAM memory for seven spare image storage screens, and uses the main 64k of system memory for a battery of sophis-ticated paint and animation programs. There is a board for video encoding (it outputs a broadcast- quality video signal), a digitizer board (inputs images from a video camera to the system), and various ports for high-resolution RGB monitor, modem, printer, terminal, and electronic tablet.

LIVE! VIDEO

A-SQUARED Systems of Oakland produces a color video board which will be available through Commodore for around $300 in June, 1986. This is an electronic "black box" which plugs into the expansion port on the right side of the Amiga. It captures images from any video camera (color or black and white) or from any good video source (VCR or composite view image). Images appear in real time (several per second)! Any image can be "frozen" instantly, and saved on the Amiga 3 1/2" disk. These images have detailed resolution, in 16 levels of grey, or in 32 colors. The Amiga's disks hold almost a megabyte (880 kilobytes), so from 15-20 images can be saved on a disk, depending on complexity. We usually do our digitizing in grey-scale and then add color with DeLuxe Paint to suit our artistic moods.

DREAM COME TRUE

With the Amiga's mouse you feel linked to the computer. Input is steady and responsive to your hand movements. Some operations are more convenient to activate with a single keystroke. The most often used functions can be operated either way. After years of familiarity with a stylus and bit-pad, mouse input has taken a bit of getting used to for me. Bit-pads have problems too, principally radio-frequency interference. R-F is not a problem with the mouse. Also, the mouse just rolls along the table surface, requiring no special pad. It can be positioned very precisely over any pixel on screen. In DeLuxe Paint's "magnify" mode the pixels can be shown greatly enlarged, making retouch a breeze.

I have found nothing "hard" about the Amiga. Even hard-copy isn't hard to produce. Amiga has both serial and parallel ports. Its operating system has built-in accomodation for many brands of printers. We use the Okimate 20, which for about $250 provides glowing prints of the screen on slick paper. Every pixel is trans-

mitted, with color remarkably faithful to the screen. Prints show slight horizontal lines marking overlaps of the printhead. Plotters are available which interface to the Amiga for perfect (and more expensive) hard-copy. The RGB video screen can be photographed directly using a 35mm SLR camera with Ektachrome Daylight 100 slide film. The results are of professional publication quality. Museum quality Cibachrome prints can be made from the slides.

AFFORDABLE SYSTEM

Once addicted to computer graphics, acquiring a system of your own is the next step. A high-end system runs over $50,000. Until now affordable micro-based systems didn't provide the graphic "horsepower" I'd come to expect with the Via Video system. The developers of Amiga apparently did their homework well; now a professional quality system is on the market for around $2000.

What do you get for the price? Most important, you get a good RGB video display. Any 32 of 4096 colors can appear in low-resolution mode, with 16 colors in high-resolution. Low-resolution is a screen array of 200 by 320 pixels (dots). High-res has 400x640 pixels. Since hi-res is an interlaced display, some colors are a bit flickery, so we usually use low-res and enjoy all 32 colors. DeLuxe Paint software from Electronic Arts makes the most of Amiga's impressive graphic powers; it provides all the drawing tools we have come to expect on the high-end systems. This software even provides a bonus: every function operated transparently to all the others. The number of ways that different operations can be combined seems almost unlimited.

DeLuxe Paint provides a wide range of standard brushes, pens, and airbrushes. Even better, any part of your image, or even the entire image can be designated as a "custom brush". For example you can create a shaded sphere, make it into a custom brush, and use it

with any other drawing tool, such as circle, ellipse, or box. There is a handy UNDO function to restore the image to its condition prior to the last mouse click. This encourages graphic experimentation, since a press of the UNDO key (u) permits a graceful recovery from any unwanted effect.

Although not all micros based on the 68000 microprocessor support multi-tasking, the Amiga does. Thus, several utility programs can be operating in the background while the artist uses a favorite paint program to create art on the live screen.

Amiga also includes composite video output. Connect this signal to a VCR for creating computer graphics animations in real time. what appears on the RGB monitor, also appears on the composite monitor and gives a good clear recording on the VCR. Put the VCR on "pause" to allow changing the image without recording.

WHAT NEXT?

The complete computer graphics workstation is available now, often at discounts from the quoted prices. You don't need to be a computerist to start exploring computer graphics productively from the start. The operating system is very intuitive and graphic. The manual is only used occasionally after a first reading. All energy is free to bring artistic ideas into focus on the display screen.

With so much graphic power available in a small, affordable, and available package, what more could the artist wish for? New computers create new markets, and the millions of artists now trying computer graphics for the first time are drawing market attention. Amiga software packages are appearing each week; and hardware peripherals promise to add new imaging power at a small price.

Aegis software is marketing a variety of CAD and animation products for the Amiga. Images produced on most graphics software are made compatible with each other through use of the standard file protocol initiated by Electronic Arts. This is known as Interleaved File Format (IFF).

If you are the acquisitive type, an army of Amiga programmers is working day and night, creating a steady flow of graphic goodies to enrich the computer studio. These include video editors, synthesizers to add sound-tracks to videos, and desk-top publishing programs with high-quality font output to laser printers.

As our software libraries grow we need more and more RAM memory capacity, especially for work in high-resolution. Amiga has planned for expansion, being upgradable to eight megabytes of RAM. Fast hard-disks are available too.

Amiga has come to market with a color imaging tool that addresses the professional's needs for versatility, openness, good resolution, multitude of colors, video input and output. As Amiga established itself in this niche, we expect Mac and Atari to be competing seriously for a significant place in it too, with price breaks that will bring added computer graphic power at lower prices than we are seeing now. Starving Artists may have to wait out a year of price cutting by major companies before bringing computer graphics to their garrets. But this quiet revolution has taken place much faster than we thought possible in the pioneer days of '81.
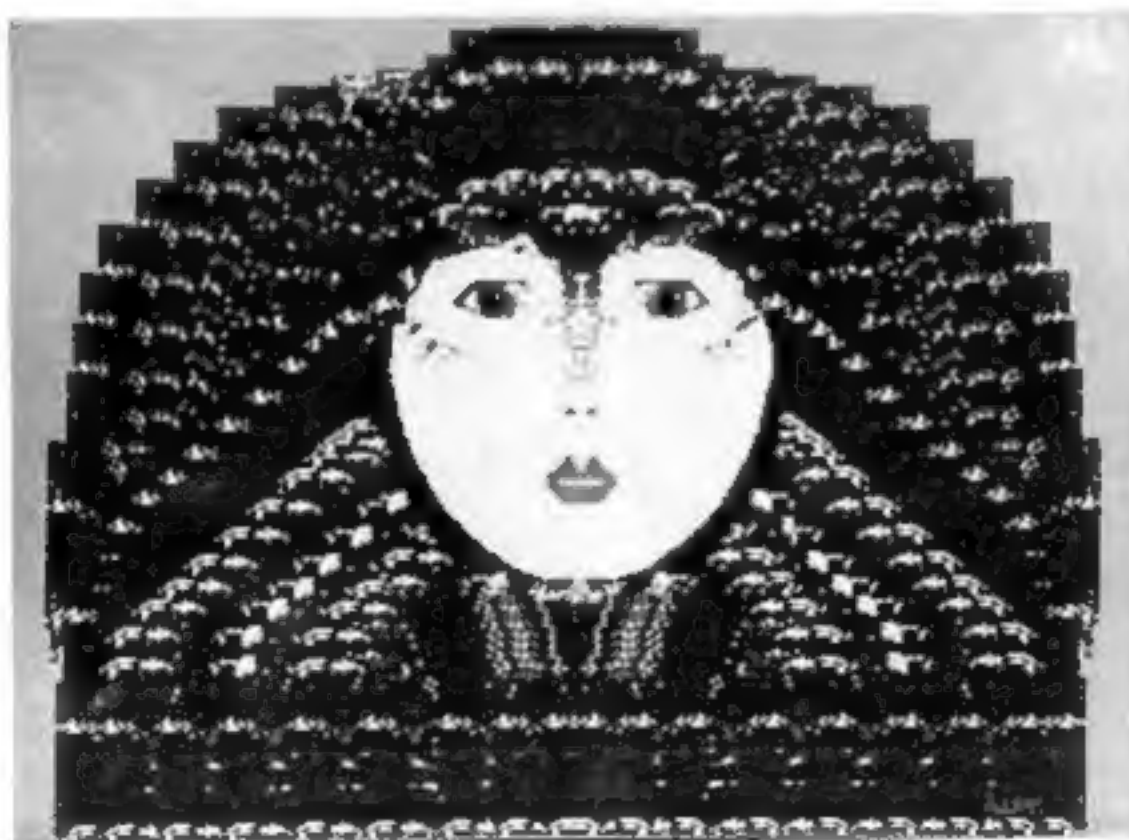
China Doll, 1983, by Luz Bueno

BOOK REVIEW
COMPUTER GRAPHICS-
COMPUTER ART

By Herbert W. Franke
(Second Revised and Enlarged Edition)
1985 177 pages, 133 illustrations,
hardcover, $48.00.
ISBN: 0-387-151494

Available for $48.00 plus $1.50
shipping from Springer-Verlag New
York, Inc., Dept. B, 175 Fifth Ave.,
New York, NY 10010. (Also, ask for
their book catalog. It includes many
new releases in computer science,
computer graphics, and computer
animation.)

This book can be a great help if you're
new to computer graphics.

It lays out the basics in terms of
hardware and elementary computer
operations.

It's especially good as a guide through
the growth of the technology that
promises to reshape the world of the
visual arts.

The aesthetic implications of
computer graphics dawned on
artist-technologists from the be-
ginning as they watched sine wave
patterns on their Cathode Ray Tubes.

It was a minor step from watching
ready made patterns to making
custom patterns based on Moire
interferences, line zig zags based on
random number generators, and
simulated spatial surfaces based on
mathematical equations.

Then came more controlled pattern-
ing and operator generated tech-
nical and business charts and graphs,
line drawings, Computer-Aided
Drafting, symbol processing and 3-D
wire frames.
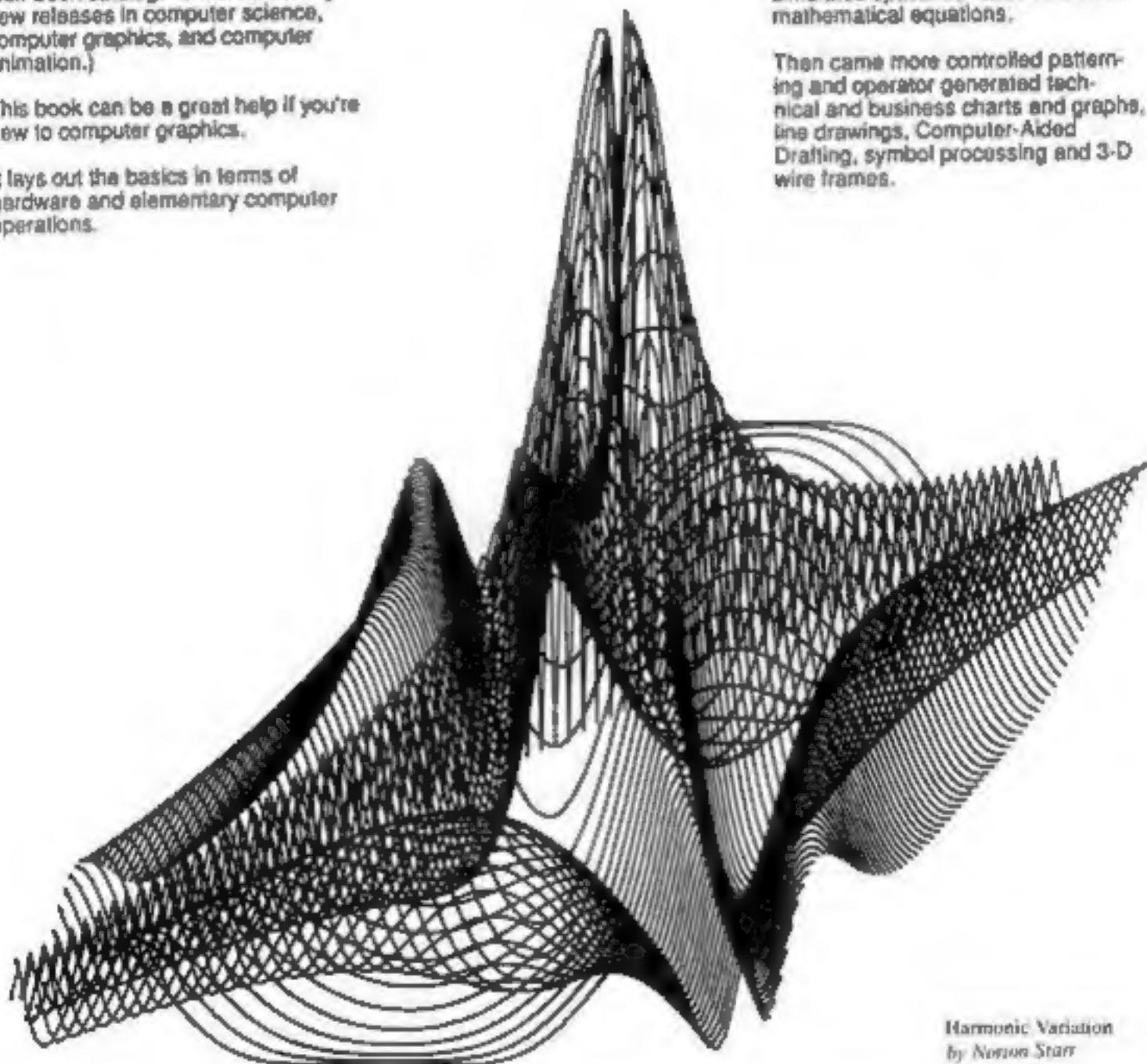
Harmonic Variation
by Norton Starr
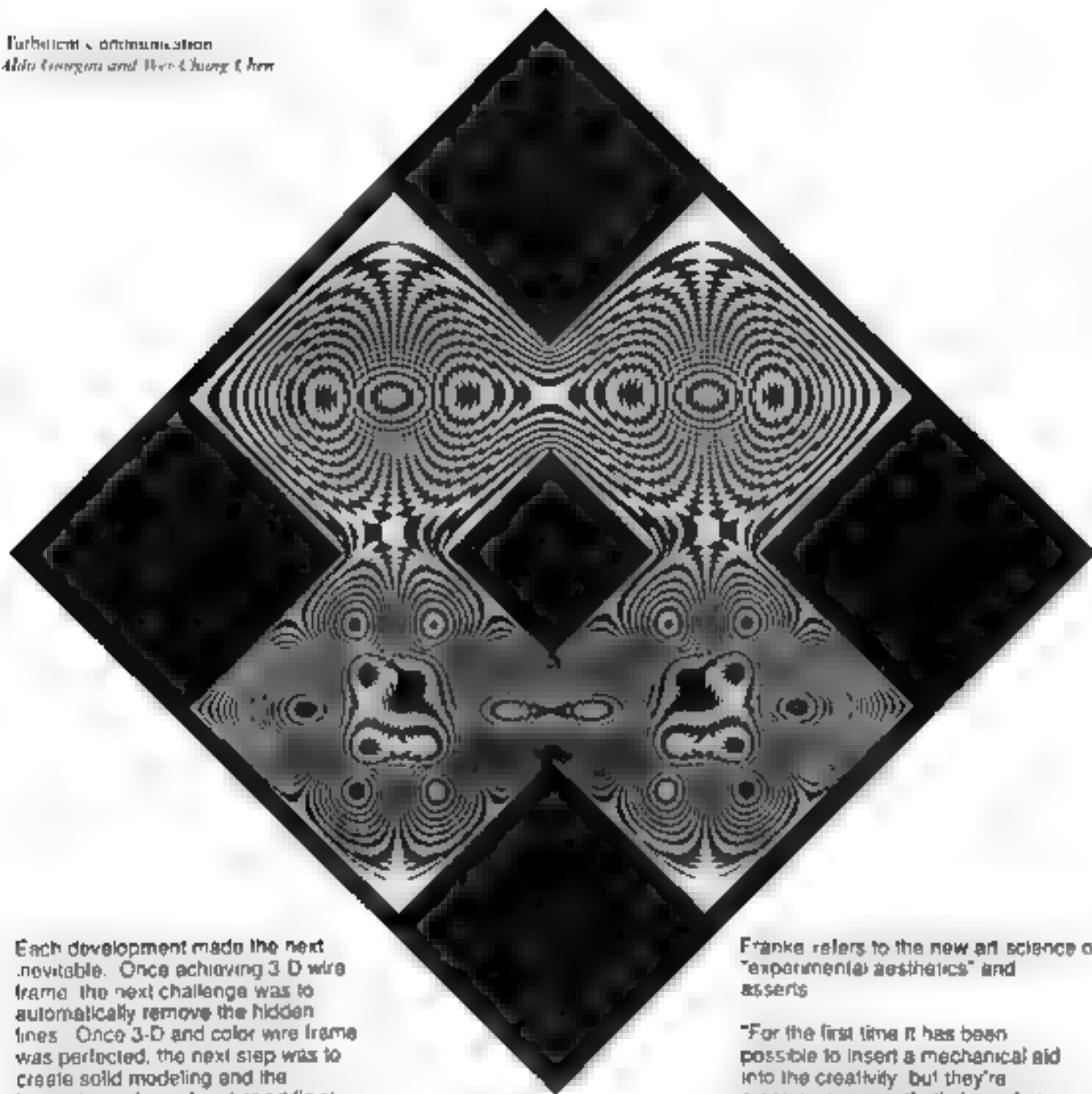
Each development made the next inevitable. Once achieving 3-D wire frame the next challenge was to automatically remove the hidden lines. Once 3-D and color wire frame was perfected, the next step was to create solid modeling and the beginnings of simulated or artificial reality.

After solid modeling we're into animation, real time simulation and 3-D and 4-D shapes that can turn themselves inside out. Side by side with the new arts of simulated reality is something with vastly greater potential. The creations of life like images of realities that don't exist — worlds of the imagination that can be made real.

Franke refers to the new art science of "experimental aesthetics" and asserts

"For the first time it has been possible to insert a mechanical aid into the creativity but they're crossing over aesthetic boundaries. Computer imagery and computer aided art is applied also in sculpture design, music, poetry, choreography and architecture.

"The newly opened dimensions of animated graphics which represents an analogy to music and which could lead to a development just as impressive as that in music will probably have similarly far-reaching effects."

THE TECHNOLOGY OF THE BRAIN
PART THREE

By Fred Stitt

Three social/technical revolutions are underway that will have enormous impact on our individual mental capacities, creativity, and productivity.

1) __The digitization of all media.__ We'll soon see the eclipse of photography, movie film, phototypesetting, offset printing, the office copier, and related tools. All traditional forms of recording and replicating words, images, and sound are being replaced by electronic media. Thus the picture you take with your camera can include sound, be transmitted by phone, be shown on a video, modified on computer, and machine printed at any size in b+w and full color.

2) __The creation of the Dynabook or its equivalent.__ The Dynabook is a proposed information storage package, possibly the size of a lap-size computer that will hold all the recorded information that exists. Anything you might want to know about or refer to or get a copy of will be there in the Dynabook. The hundreds of diverse information services that are now forming around the world are small parts of what will be the ultimate information machine. Japan is already on the way towards digitizing all its published literature and may be the first to produce a culture-wide Dynabook.

3) __Xanadu is the name of another bold informational goal:__ mainly the categorization and hence "precreation," of all possible categories of information that can exist. One objective: To create an electronic international publishing system whereby anyone can input any type of prose or poetry, art or design, speculation or research documentation, music or drama, instruction or technical information. Each contributor will be paid for their contribution to the data

bank in proportion to the amount of time other people hook in and scan or copy their inputs.

Thus original new art, literature, music, news, political commentary, cartoons, problem/solution analysis, ideology, theology, education, games —all enter one massive special-interest electronic flea market. Everyone's work is accepted or rejected NOT by go-betweens and arbiters of taste such as editors, curators, or committees. Instead, acceptance is strictly up to the customers.

There'll be similar exchanges among independent contractors offering such professional services as commissioned art, medical tests and diagnoses, editing and typesetting, legal advice, design services, etc.

Liberation occurs on two fronts with Xanadu. The response and pay for your work is between you and your patrons and nobody else. You can have hundreds or thousands of potential employers and clients. And you can commission and employ services from the same pool. (All can be in total privacy since cryptographers are busily creating codes the government can't crack.)

The technical and theoretical groundwork is already laid for Xanadu. The problems lie in cataloging and arranging the database, and of course, in the intricate hardware and software.

Xanadu has several originators and several groups are working to achieve the database structure necessary to handle it. We'll report on their efforts in a later issue. For now it's apparent that the multitude of formal and informal computer bulletin boards, special interest networks, and electronic data services represent the modest start points of one or more universal knowledge, skill, and talent trade centers.

Dynabook is to handle all existing data, Xanadu will take care of all new data. Want information? Check your Dynabook. Want a tutor or mentor or inspiration in any realm at any time? Dial Xanadu.

The Dynabook is the dreamchild of Xerox theorist Alan Kay. It and similar concepts by Silicon Valley theorists are envisioned to become much smaller than book size. They're to become VERY small and built into the environment much as the talking appliance chip is now.

Other well-known and widely discussed concurrent developments are tied in with all this and don't need to be elaborated on here. That includes Artificial Intelligence, advanced Image Processing, and the creation of Artificial, Recreated, or Simulated Realities.

"Artificial Realities" created as images are one thing, but there's also the promise of creating them as material objects and environments. How that might work is one of the mind bogglers of our time.

Eric Drexler, recently of the Space Sciences Lab at MIT, is one of the pioneers in the realm of molecular scale design. He designs machine and computer components that are the size of molecules. Although some people think the concept of design and manufacture on that level may not be possible, Drexler responds with numerous examples, already fully functioning in the world of viruses, crystal growth, biochemistry, and contemplated near-future developments in micro chip and circuitry design. Most of the components already exist, we just have to duplicate them and recombine them.

The early versions of molecular machines will be crude, perhaps even

visible to the eye. They will be put to work to create self-replicating smaller versions.

I asked Eric some months ago about the data recording and playback potential of molecular-based systems. He proceeded through a technical construction of a music system that could store and play back in perfect fidelity all the music that has ever been composed. The works could reside in a mechanism the size of a signet ring. The actual mechanisms would be much smaller. The ring size is just to help avoid losing it.

I also asked about the implications of his and similar research on my own specialty — architectural materials, environmental design, and building construction. He pointed out applications where the phrase "Intelligent Building" will be a much more accurate description of the truth than it is now. Keep in mind that he envisions molecular-size computers with megabyte RAM acting as parallel processors and being self-directed components of larger objects. Any object you can imagine could "come together" as self-activated components that can assemble themselves to match any specified material characteristics.

Any material could be simulated: A wall, a machine, a printed page, a sculpture, a meal, an insect, a person — whatever — all solid, real, and "intelligent." As they could assemble themselves when needed, so could they disassemble when no longer needed.

How design on this level? No one knows yet, although complex musical and organic structures offer some starter examples. Meanwhile Drexler suggests other avenues of opportunities for his molecular machine. They could travel and do tasks. They could enter the body and the nervous system, do repair work, clean out damaged DNA in the cells, reattach damaged nervous tissue, and bring damaged human intelligence and consciousness back to health.

This brings us finally around to the subject of this series of articles. The Technology of the Human Brain.

We confront now the inevitability of instant access to unlimited types and quantities of information; unlimited channels of learning, self expression and work. These are certainties as simple follow-throughs on what is already well-established technology.

At this point there's no more mental repression. Anyone of any age can learn whatever they want from whom they want and as they want it. The public schools won't be able to do a thing about it and will restrict themselves to be athletic and social careers. Which, of course, is already their primary function.

Just as people will begin to learn at their natural pace which is demonstrably many times faster than is currently acceptable to compulsory education as "normal," so they can accelerate their working careers.

We're on the threshold of molecular electronic and robot technology which will hand us access to experimental exploration and brain extension of near-cosmic proportions. It means everyone will gain moment-to-moment personal access to computer combinations vastly beyond all the existing computer power in the world. (This is already considered a certainty by computer theorists at IBM, Xerox, MIT and the like, with or without molecule-size machines and circuits.)

At last our tools and their speed will begin to match what we're already hard-wired with. We'll start to function at a level that matches our potential. Then we can turn more attention to the master issues of life such as existence, and the nature and development of human consciousness.

In Part One of this series, I presented some estimates on the amount of information the brain processes per second. We saw the best current estimate as being equivalent to what it would take to flash 15 billion English words per second across a giant TV ▇▇▇.

And that was just the brain, not the almost comparably complex network of nervous tissue that weaves throughout the organism, nor the semi-autonomous intelligence that pervades the organs and cells of our body.

Acknowledging the enormous sensory, perceptual, and cognitive potential of the human species we sought some explanation for what seems to be almost universal human underachievement.

One explanation, suggested in Part Two, was that a consequence of compulsory education might be the imposition of massive self-repression of human intelligence. Since public schools spend ten to twelve years conveying information that can be and often is learned in about one year's time, much classroom activity has to be dedicated to holding the kids back and blocking any unbridled self-initiated attempts at all-out learning.

In this article I've cited several contemporary technological trends that point a way out of the underachievement problem. In Part Four I'll describe current techniques people are using to break away from cultural restrictions and self-repressions. A surprising number of people have started enjoying a vast imaginative and intellectual potential that was previously concealed to them.

Just to clarify the preview: These people haven't paid money, attended trainings or esoteric meetings, nor given away some part of their integrity and identity to a guru in return for such enlightenment. It's just that they've picked up some technical problem-solving knowhow and applied it to the most interesting problem of all — the workings of the human problem-solving organ — the brain.

Book Review

Growth Morphogenesis--A Journey to the Origins of Form

Yoichiro Kawaguchi

This spectacular compact portfolio is newly arrived from Japan. The subject is Form. The artist is Yoichiro Kawaguchi.

Yoichiro Kawaguchi is among the first of the true computer artists. Like David Em, he is among the first to reach beyond the furthest thresholds of contemporary aesthetic expression. He's an artist of Form--or more accurately he's an artist who works through, and with, and within the formative process--truly from the inside out.

Kawaguchi has captured the essence of Form not as static structure, or shape, or object but as the physical expression of growth pattern--growth determined and ordered by intricate hidden geometries.

Recursive growth, fractal growth, growth by acquisition, clustering, growth by assimulation, theme and variation, growth by cellular/modular repetition, branching growth, growth in every aspect is presented here in multidimensional full-color abundance.

These excerpts from the Table of Contents tell some of the story

He says: "...there is a way of creating living things and/or nature under a quasi-reconstruction of the laws of the natural world."

"Computer graphics is not satisfied simply to surpass a simple spatial phase, it must go beyond even a time stage. Perhaps we ought to construct computer graphics so that it will push out in a wider sphere...."

"Once the first idea and inspiration start floating up, I earnestly try to bring a new image world to ▮▮▮▮▮▮▮ conducting a dialogue with the ▮▮▮▮

The images in this full-color book, stunning as they are, don't show the power of the images in their natural state—in motion. The illustrations we have here are still another level below reality, limited as they are to black and white.

Get the book for the full treatment. You may not care for all the images—it's hard to imagine that anyone would, particularly since they're out of the context of animation. But some are bound to get to you, as are the processes he is demonstrating. And you'll appreciate the verbal problems Kawaguchi has in coming to grips with what he is doing. It's hard to describe that which hasn't been named or barely thought about as yet.

For those who want all the hoary hardware, software, and processing details—that's all there too. Don't miss it

Growth animation by Y. Kawaguchi
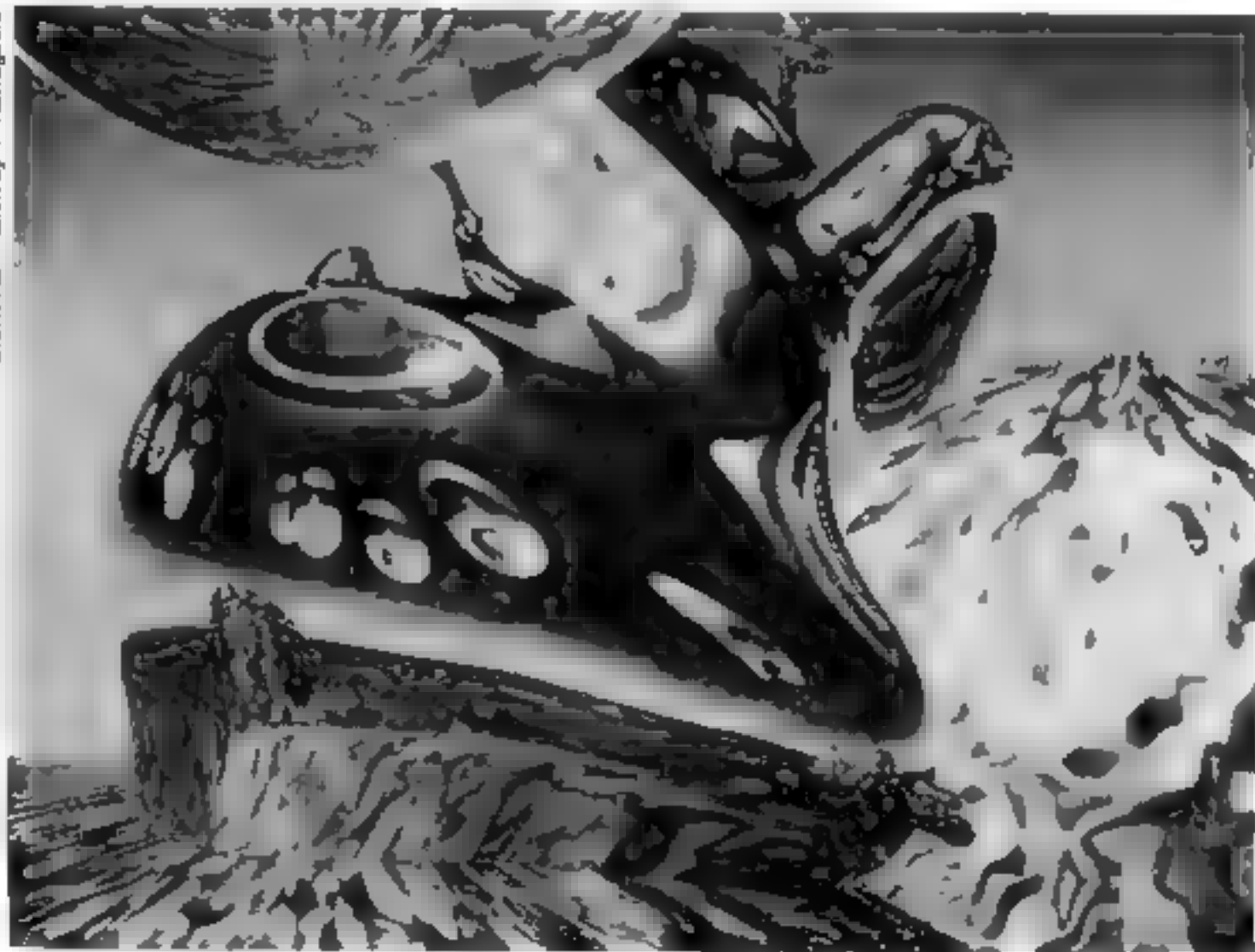
OCCLUDED FRONT
JAMES TURRELL

Edited by Julia Brown

"Responses to the art of James Turrell by members of the art community, plus an interview with the artist." Published to correspond with the artist's exhibit at The Museum of Contemporary Art, Los Angeles, November, 1985.

157 pages, 77 illustrations. The Lapis Press, Available for $19.50 plus $2.00 postage Contemporary Arts Press, P O Box 2123, Rincon Annex, San Francisco, CA 94119.

Despite self descriptions to the contrary, not many artists actually use LIGHT as their media.

Some use the effects of light, such as reflection from pigment. Some use the effects of light interacting with emulsion or phosphers as in photography and video. Some design with light sources such as neon. But nobody designs with light and the eye quite like James Turrell.

Turrell composes light pure and simple, and does things with the eye, human perception, and cognition that have no equivalents in any other media. He says:

"As sound can fill a room, so can a certain tone of light. A resonant light tone can make a space congeal to the point that space can almost be felt."

Turrell is also an environmental artist, but unlike others.

Turrell builds environments accurately described in his own words:

"Where the piece begins and the work ends just vanishes and doesn't matter anymore. It melds into where you are."

And he does smaller pieces of extraordinary technological refinement.

For example a design for a crystal table for enjoying wine required precise astronomical calculations.

The site is an Italian villa. A moving telescope is mounted on the roof to track the moon.

When the moon appears, it is tracked via fiber optics down a wall and under the floor of the room that contains the crystal table.

Kraus Pres, 1985
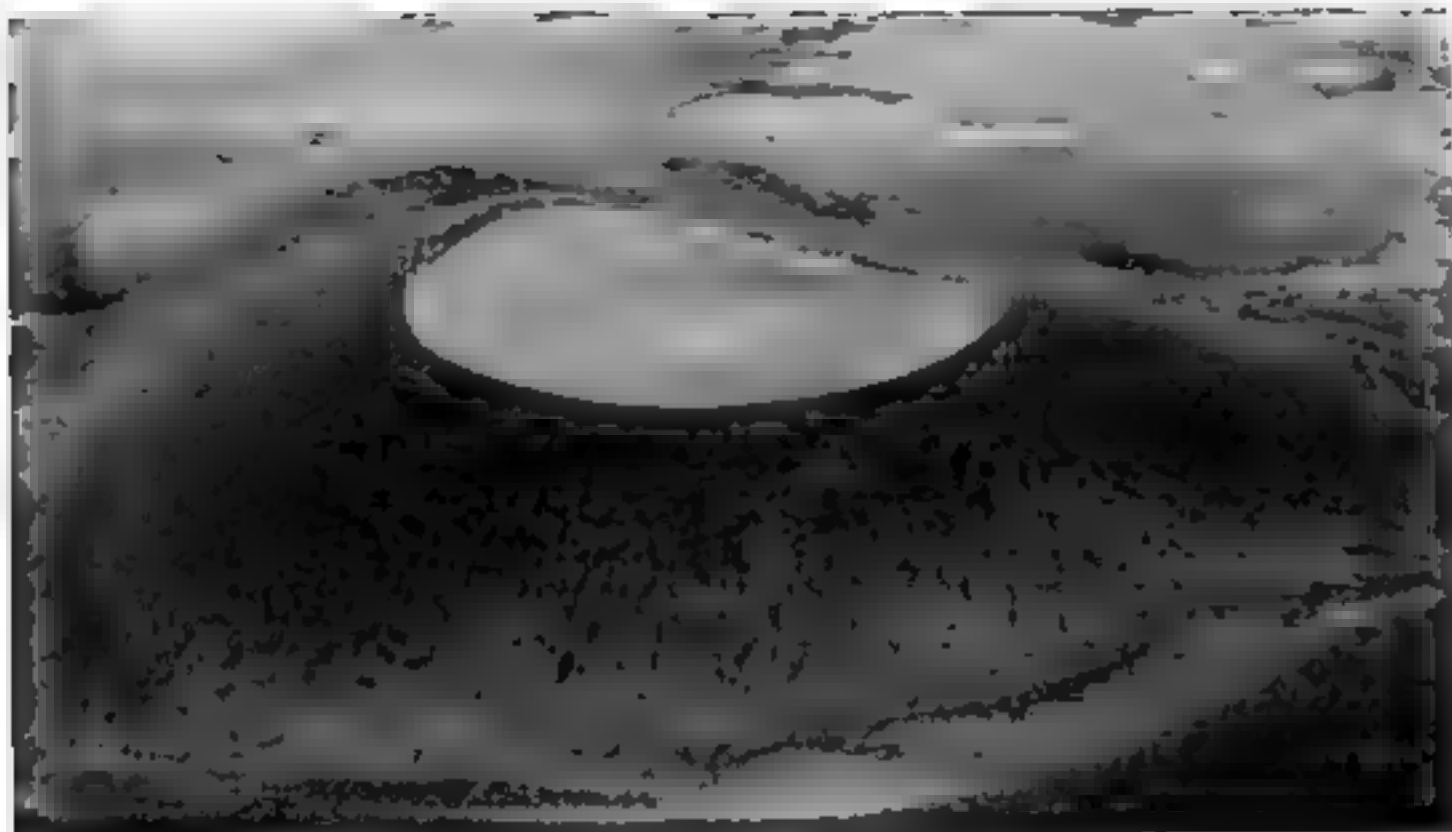
Crater bowl after manual shaping 1/94

In the top surface of the table are indentations for four optically ground wine glasses. When the glasses are filled with a liquid of the correct index of refraction (white wine, fortunately), the image of the moon floats on the surface of the liquid.

The focal length of the image changes as the wine level lowers so the moon shrinks and fades as the wine is consumed.

This level of sensitivity comes from an artist who has made his living for years as a specialized pilot--doing aerial photography and mapping, and delivering equipment to archeologists and mining companies in the southwestern desert.

These pieces are small samples from the past 15 productive years. They were born of humbler beginnings. For example:

"My first attempts to use light as space were in 1965 and 1966, using gas to create flat flames. ... I had a number of explosions when first showing these pieces, and they were soon abandoned."

When asked if his sources included more everyday experiences with light, Turrell responds:

"Yes. Light bouncing off the water, or a shaft of light in the forest coming down through the trees, hitting the ground and splashing up, underlighting the trees--situations where you can literally feel the fluid quality of the light."

Interviewer:

"The kinds of experiences you've be describing are almost openended-transitory and seemingly uncontainable—yet in your work they're formed and controlled."

Turrell:

"... I form it as much as the material allows. I like to work with it so that you feel it physically, so you feel the presence of light inhabiting a space.

I like the quality of feeling that is felt not only with the eyes. It's always a little bit suspect to look at something really beautiful like an experience in nature and want to

make it into art. My desire is to set up a situation to which I take you and let you see. It becomes your experience. I am doing that at Roden Crater. It's not taking form nature as much as placing you in contact with it."

Turrell on flying:

"Early on I was struck by Antoine de Saint-Exupery's description of flight spaces in his books Wind, Sand and Stars and Night Flight. He described spaces in the skies, spaces within space, not necessarily delineated by cloud formations or storms or things like that, but by light qualities, by seeing, and by the nature of the air in certain areas. For me, flying really dealt with these spaces delineated by air conditions, by visual penetration, by sky conditions; some were visual, some were only felt. Those are the kinds of spaces I wanted to work with—very large amounts of space, dealing with as few physical materials as I could."

Turrell's tools include after-image, the difference between rod and cone vision, sensory memory, what the eye itself brings to seeing, sense activation that effects other senses, and the effort that eye and mind make to adjust to ambiguity.

The results have included apparent objects in space created by flat light projection on walls, atmospheric light in a space viewed through a large "framed" window that appears as a painting on a wall.

A patron at the Whitney Museum backed into one such illusionary painting, fell into the adjacent space, and sued for injuries. Turrell is bemused by the plaintiff's "unorthodox approach to viewing art objects."

Turrell demonstrated sensory synthesia in a "window" of light where the body detects a noticeably cooler temperature when you put your hand through the image. A journalist accused the artist of using refrigeration equipment to create the illusion.

Roden Crater is Turrell's magnum opus. It's a volcano near the Painted Desert that Turrell is reshaping to ▓▓▓▓▓▓▓▓▓▓▓▓▓▓ istic experience of the celestial cosmos. The point is that we are already IN the cosmos and we can experience universal scope time and space without a spaceship.

One of Turrell's supporters describes it:

"Instead of utilizing neon and zenon light projection in the manner customary of his earlier pieces, the Roden Crator Project will be entirely driven by the motion of the sun, the moon, ▓▓▓▓▓▓▓▓▓"

We'll report more on the Roden Crater Project another time but the project is thoroughly and beautifully documented in this book. Turrell's work and the experience of this book is nicely summed up in the Intorduction by Theodore F. Wolf:

"James Turrell's work is extraordinary not only because we know exactly what he is doing, but becase his methods are remarkable integrative and life enhancing. There is plenty of art that is primarily pleasurable, formal, ideo-syncratic, or assertive; but very little that celebrates and provokes clearer and more holistic perceptions of ourselves, reality, and truth--especially in a format that is startlingly beautiful in and of itself."
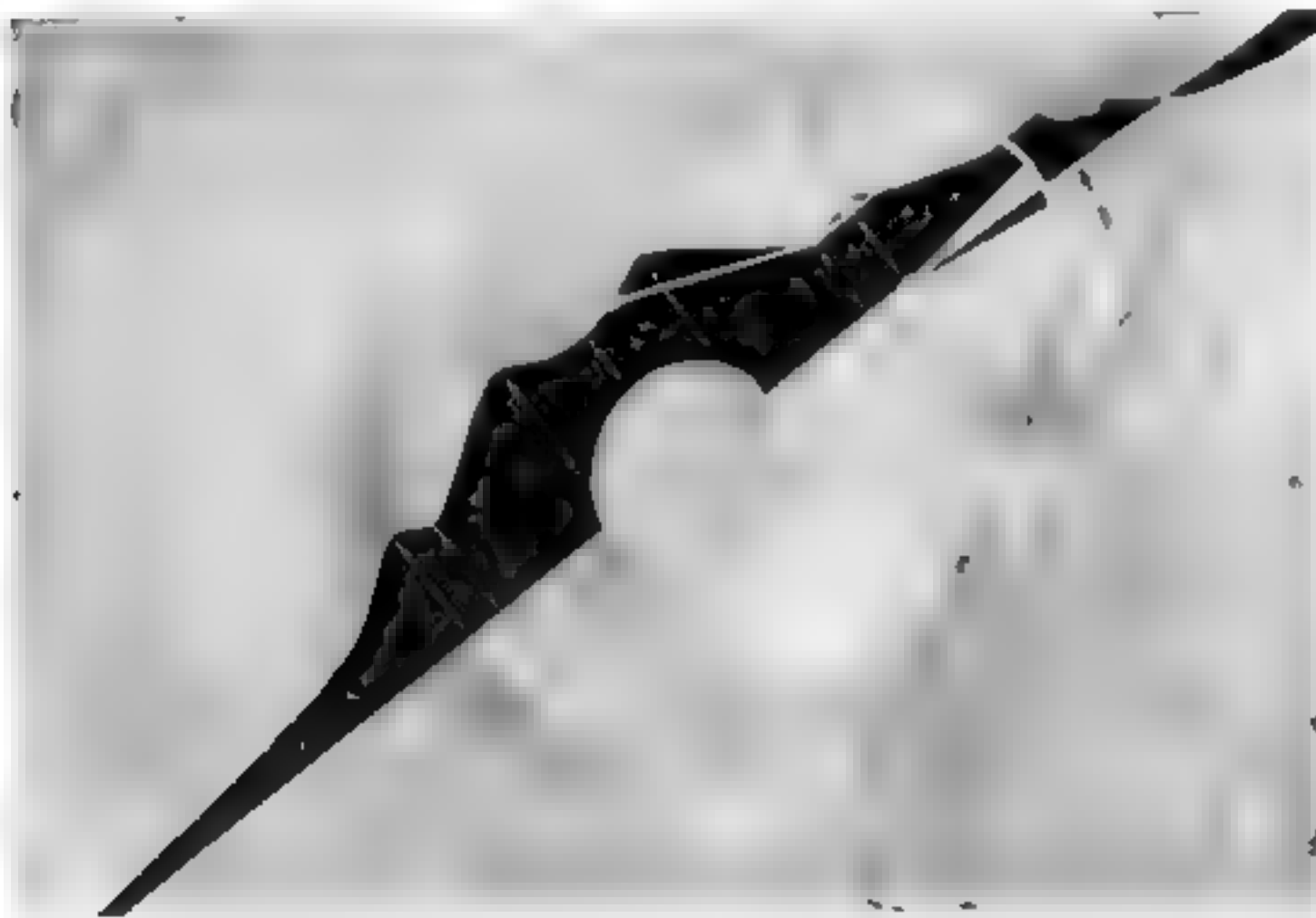
Roden Crater and cross-section with fumarole at right

YLEM FORUM SYNOPSIS -

APRIL 5, 1986
BY TRUDY MYRRH REAGAN

HOLOGRAPHY AND ART, THE CUTTING EDGE

The auditorium that is perched near the two-mile-long linear accelerator at Stanford proved to be a nice hi-tech setting for one of Ylem's most technical forums. Blackboard and an enormous slide screen both moved up and down (sometimes without warning), and the abundance of outlets and formica counter tops made the cables strung to lasers and holograms look right at home. An animated hologram sat at center stage, a revolving transparent cylinder about the size of a large lampshade. Lit from below, a holographic image danced in the center about where one would expect to see a light bulb.

A local paper had even run a story on the forum that began, "Scientists will use a laser to show how holography works." This proved to be a little misleading, however, as attenders found themselves surrounded by artists.

Ylem was very fortunate to have L.A.S.E.R., an organization of holographic artists, arrange the whole program. Unlike many forums, where technical information is slipped in between visual displays (a spoonful of sugar make the science go down), the forum began with a chalk talk by Bruce Goldberg, who has a solid grounding in physics. His diagrams helped the rest of the program make sense. Joe Bell's slides documented the long history of artists' fascination with 3-D starting with the ancients. The concept of holography, of course, has been the greatest advance in storing a 3-D image upon a flat surface. Curiously, physicist Dennis Gabor invented it in theory before the invention of the laser, the instrument that makes it possible. Louise Brill, editor of the L.A.S.E.R. newsletter, and organizer of the forum, had slides to reinforce what Bruce Goldberg had explained, and to show a variety of holographic art techniques. Finally, after intermission, the ████████ was treated to a laser light show by Craig Charbonneau, Robert Fabo, and Emily Wilson, who call themselves "Laser Dreams."

Holography is a scientific development based on properties of light that are only familiar if one has looked around with the pertinent experiments and mathematics. However, Bruce Goldberg had a talent for clear description and choosing good metaphors. For instance, one questioner asked about the mystery of the broken hologram. The information about an object is "all over the photographic plate, so that when it is broken, a view of the object can be reconstructed from each piece. How can this be? Goldberg explained. Just as you can see a whole scene through a window, and can see about as much when you peek through a hole in its windowshade, so a hologram is a "window" onto the object. In an ordinary photograph, point A on an object is focused onto point A on the photographic emulsion. The lens does the focusing. Holography is lensless; the light bouncing off point A affects points all over the emulsion, along with information from every other point, like light coming through a window. (Because this multiplies the amount of information by millions, an extremely fine-grained emulsion is used.) Thus, a shard of a holographic plate would contain some information about the whole scene.

The quality of light emitted from a laser is coherent. It leaves the instrument in waves that are identical in amplitude and in phase. If it becomes scrambled, funny interference pattern effects appear, similar to ones in ocean waves hitting the shore at various angles. If the top of one light wave hits the trough of another, the result is cancellation, no light. This was demonstrated later, after the light show, by shining laser light through the bumpy bottom of a Mason jar. Spidery patterns of light and dark appeared. Light from a laser hitting and reflecting off any object becomes scrambled, or diffracted, as it curls around surface irregularities. People remark on the sparkly, particulate quality of laser light hitting the wall. Since any wall is slightly irregular, what they are seeing is a bit of diffraction.

To code a holographic image onto a photographic plate that can be "read" again, two beams are needed: one that is in phase, the reference beam, and the object beam, one that has hit the object and is being messed up in a way that is unique to that object. The holographer arranges for the two to combine and make interference patterns just as they reach the photo emulsion. (No lens here!) Later, when a beam like the reference beam strikes the plate, it is diffracted. The light bounces out in the same pattern that was produced by the object, and the object reappears, more lifelike than a ghost. A shift of one's head, a shift of the light waves hitting the eyes conjures up another aspect from a different angle.

Louis Brill showed several slides of holographic setups. Most thought it odd at first to have him speak of the camera as being the gigantic super-solid, vibration-damped table, laser, beam splitters and beam spreaders, and photo emulsion. But camera means "chamber." While we usually think of this chamber as containing only film and lens, in this case the object sits on the table in the midst of the instruments in the chamber. There is no lens. The photographer stands inside it, too, holding his or her breath, praying for no vibrations.

To set up for one shot may take several days. Just as in the early days of photography the glass plates are expensive, the setup complex, so the goal is perfection on the first shot. The patience required speaks volumes about some artists' enchantment with three-dimensionality.

Everything is reproduced actual size, and the depth of field is only a few feet. (Hologram castles or trains are only toys.) Holograms can't be enlarged. Brill showed slides of holograms as large as one meter wide. A plate this large was used. He showed ones with vivid color differences produced by several masked exposures, portraits, ones of space filled with streaks of pure light, and a 60-foot Christmas tree made of diffraction grating. This eye-dazzler can be seen every December at the Hyatt Regency, San Francisco. It is animated by interior lights that light up when spoken to.

Four actual holograms were on view, plus the most spectacular display, the revolving holograms that moved. Joe Belk explained that Cross holograms, named after its inventor, are actually made from narrow images taken from frames of movies. In some extraneous light on the ceiling the audience could see stripes where the narrow images were joined.

Belk's slide talk had traced the history of 3-D illusions, from the carefully shaded drawings of Romans and Arabs, to Renaissance perspective studies, to holograms. Now, placing a new "lampshade" on the stand, he presented us with a model of 4-D. A computer-aided design (CAD) system had created the animated version of a tesseract, the generalization of a cube to four dimensions. It rotated and appeared to turn itself inside out. Many computer-calculated views of it had been transferred, just as the movies had been, to the strips of a Cross Hologram. Voila! A synthetic image of a theoretical object came to life!

Finally, Laser Dreams treated us to music and light. The aqua blue light from their argon laser spun familiar but beautiful lissajous figures. To this they added designs drawn on a Koala Pad and computer. Sequences of these made simple animation. They had brought a pink trunkful of equipment to make the computer to moving-laser connection.

Featured in this issue

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Christa Schubert
Quikdata Telecomputing
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Alexander, acclaimed internationally for his monumental sculptures, will also have many of his holograms on display. Utilizing laser technology, he has challenged current holographic size limitations with the featured 6' x 3' work "DANIELLE'S DREAM".

Some of the the other artists to be featured include: Stuart Bender, Robert Campbell, Lynn Hershman, Gary Hill, Mark Lindquist, Ed Emschwiller, Guy Marsden, Michael Scroggins, Vibeke Sorensen and David Stout.

Modern Visual Communication Video Theatre will have screenings nightly, adding on weekends a children's video/performance matinee series, "THE MEMORY GARDENS," and late night performances for adult "insomniacs".

The Technokinetic Cafe will be serving refreshments from a 1952 Airstream trailer.

A retail gallery will offer artists' tapes, signed limited edition computer graphic prints, holograms, fiber optics and electronic portraiture.

Modern Visual Communications is the creation of Richard Kennedy and Karen Miller Kennedy. After 10 years in design, Richard became intrigued with the possibilities of electronic art. Concurrently, Karen desiring to expand her nine years experience in theatrical design, joined Richard in five years of study and researching the electronic art medium. They found a movement of artists who have been working at a distance from the general public, yet supported by institutions such as the Guggenheim Foundation, the National Endowment for the Arts and locally by the Long Beach Museum of Art and the American Film Institute.

The Kennedys made the decision to form a comprehensive center making accessible this now collectible work to people on many levels. MVC is committed to the electronic art medium and to those electrofuturists working with it.

The MVC complex is open 10 a.m. to 10 p.m. Tuesday through Sundays beginning May 20. Location is 7229 Melrose Avenue, three blocks west of La Brea Blvd. For more information, call (213) 939-3339.

RANDOM ACCESS
Ylem News and Events

Ylem Secretary Fred Stitt is conducting a one-day conference on THE COMPUTER REVOLUTION IN DESIGN EDUCATION, Tuesday, June 24, at the Palmer House Hotel in Chicago.

Speakers representing architectural schools at Ohio State, UCLA, Pratt, Kyoto Institute of Technology, UC Berkeley, the University of Houston, and others will show the latest on how students are putting buildings together and taking traditional design methodology apart with their computer systems.

Fred and Ylem Associate Editor Genny Yee are also conducting the first CADD IN ARCHITECTURAL DESIGN COMPETITION. The project is a memorial on the Chicago waterfront to commemorate the founders and ongoing representatives of the organic Chicago School of Architecture. Winners of the competition will be shown and awarded on the evening of June 23.

This conference is held in cooperation with the A/E/C Systems '88 Show-- the largest computer conference for architects and engineers. For literature on Fred's conference, drop him a card at Guidelines, Box 456, Orinda, CA.

THE NEXT YLEM FORUM

UNTITLED
Copyright 1985 by C. Schubert & Roy Montibon.
Work is designed on a Zenith 90 microcomputer which drives a pen and ink plotter. Plotted output is collaged into new images and read into Via Video paint system. The final work is output on a film recorder.

Ylem   Membership   Application

NAME _____

ADDRESS _____

CITY _____ STATE ____ ZIP ____

PHONE: DAYTIME _____ EVENING _____

If joining, please also complete the section below.

☐ to receive a sample issue

☐ $20 year's membership

☐ $15 student membership

☐ $15 monthly calendar only

U.S. Dollars only please

Ylem   Membership   Update

Dear Members ,

We are in the process of updating our files on Ylem members. We need your help to make it possible for us to compile our "Yellow Pages." Please complete this page for us. Also if you have samples of your work, we would be very interested in seeing them.

NAME _____   ADDRESS _____

ARTISTIC MEDIA

Please mark 1 or 2. Beside each, please state in 25 letters your specialty.
(i.e. : "illus. + images on cloth," "hi-res computer modeling," "bronze casting.")

___ conceptual art:

___ computer graphics/computer assisted art:

___ crafts:

___ exhibits/performance planning:

___ graphic design:

___ kinetic/interactive light or sound:

___ music:

___ 2-D fine arts (i.e. painting, printmaking, illustration, photography):

___ 3-D fine arts (i.e. sculpture, architecture):

___ video/film:

___ writing:

___ multi-media (hi-tech):

___ multi-media (not hi-tech)

___ other hi-tech

___ other

AREAS OF INTEREST: (Do not duplicate info. listed above.) Circle two.

___ Aesthetics

___ Architecture

___ Computer Graphics

___ Computer Science

___ Education

___ Engineering

___ Hi-tech Media

___ Mathematics/Puzzles

___ Natural Sciences: Biology, Geology, Botany

___ Pattern and Structure

___ Perceptual phenomenon/Visualization

___ Psychology

___ Physics, Chemistry

___ Space, Astronomy, Cosmology

___ Societies/Culture

___ Universe/Mind

On an additional piece of paper please include what your artistic philosophy is (one paragraph only) and in what areas could technical assistance from Ylem members be useful in your work.

WHAT IS YLEM?

By Fred Stitt

Simple. "Ylem" is the primordial stuff from which the universe was created. (Pronounce it "Eye-lum" and you've got it.)

It's also a thriving organization of artists and art lovers who are enamored of science and technology.

That particularly means artists who work with video, ionized gases, computers, lasers, holograms, and other non-traditional media.

It also includes artists who use traditional media but who are inspired by the images, structures, and growth geometries of crystals, electromagnetic phenomenon, and biological self-replication.

The Ylem organization helps keep members informed of opportunities to show their work in upcoming exhibits, competitions, conferences,

etc. It also publicizes and shows off members' work through its own publications and events. The active membership includes many well-known bay area figures in the arts and gallery world as well as collectors, educators, students, engineers, architects, and scientists.

Diverse techno-aesthetic interests are demonstrated every other month at the YLEM FORUMS held alternately in San Francisco and on the Peninsula. They include presentations by practising scientists who appreciate the aesthetic values within their disciplines and artists who enjoy the science and technology that underlies all art.

The Ylem Forums are hosted by Ylem founder Trudy Myrrh Reagan. Trudy almost single handedly nurtured and guided Ylem through the past few difficult formative years, providing a newsletter, field trips, expansive networking among hundreds of Ylem members, and the always amazing Forums.

Ylem also publishes a monthly Ylem Calendar - devoted to news of Forums, field trips, gallery openings, exhibits, presentations, parties, opportunities, and what-have-you.

Subscriptions to the Journal and the Calendar come with membership which costs $20 per year (subscription only is $15). You can join/subscribe or get a free sample of each by writing to Ylem, Box 749, Orinda, CA. 94563. Or for more information, call the President of Ylem, well-known glass and neon artist Beverly Reiser, (afternoons only) at (415) 482-2483.

ARTISTS USING SCIENCE & TECHNOLOGY
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